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AUTHOR Staudter, Donald V.
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ABSTRACT

An independent study course in which students investigate industrially-related topics is described. The outline of the course, from selection of the research topic, progress reports, to evaluation of the students' work is provided. Merits of this experience have been evident for students in later attempts to locate employment. An appendix lists some research project titles which have been used in the program. (CP)

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COLORADO STATE UNIVERSITY

FT. COLLINS, COLORADO 80521

"SELECTED INDUSTRIAL PROBLEM"

DONALD V. STAUDTER, P. E.
ASSISTANT PROFESSOR
UNIVERSITY OF DAYTON
300 COLLEGE PARK DRIVE
DAYTON, OHIO 45469

SE 020 213

SELECTED INDUSTRIAL PROBLEM

INTRODUCTION

Shortly after I started teaching at the University of Dayton some 9 years ago, students began telling me that their education consisted mainly of lectures and cookbook labs with no exposure to real life situations that would be confronting them after they leave college. I readily agreed with my students and set out to do something about it.

Upon investigation into ways in which this situation could be remedied, it was learned that cooperative programs and deviations therefrom did not fit into our full-time student's program and still allow the student to complete his field of study within the prescribed length of time originally established.

After a considerable amount of investigation, I formulated the idea of an independent study type of course. In this course, the student would work on a project, independently in most cases, although in a few cases, two (2) students have worked together because of the complexity, size, or proximity of one student with respect to the project or the project site.

The reason for independent projects are twofold from my viewpoint. One is that while I was in Industry, most of my projects and those of my peers were of the type in which a majority of the work was done on an individual basis. Secondly, group projects often tend to leave some students idle not to mention the cookbook approach.

PROJECT SELECTION

The first step, and of most importance to the student, is the selection of his project for the semester. If a project is selected

that the student has little or no interest in, he will not get the maximum educational benefits from his work.

I have found that to develop the most student interest in his project, he should have input into its selection. To do this, I normally begin by asking him what type of work he plans or would like to do upon leaving the University. Often, I find that students have some idea as to what they would like to do after graduation. This is partially due to the fact that the students enrolling for this course are normally third and fourth year students and thus have been exposed to numerous courses that could stimulate interest in various areas.

If it is found that the student has no specific interests, I will select a project for him. This is getting to be a rather rare occasion.

The student project topics are quite varied. They range from statistical analysis, job standards, plant layouts, economic analysis, and to research into specific areas such as heat treating furnaces and a designs project. Appendix A contains the list of some of the projects the students have completed over the years.

PROJECT EXECUTION METHODS

After the specific project topic has been selected, the method of doing the project is determined. There are occasions where the project topic and the method of doing the project are almost one and the same. This should become more apparent as we proceed.

The method of doing the project can be one or a combination of the following:

1. Research involving Library, Business, and Industry Contacts.
2. Projects carried out in a local Business, Industry, or Governmental Installation.
3. Projects concerning the University of Dayton are done primarily on campus.

4. Occasionally, students can work on a project in their home town in conjunction with a job they have or had in the past.

Some of the organizations that have participated in one form or another are: United States Air Force, McCall, Dayton Power & Light Company, Inland and Frigidaire Divisions of General Motors, Phillips Industries, City of Kettering, Formica, Monarch, Dayton Forging and Heat Treating Company, Shippingport Atomic Power Plant, City of Cincinnati, American Arbitration Association.

Projects done in conjunction with some organization are carried out in a number of ways depending on the student relationship with it. In many cases, the student will visit the facility at regular intervals again depending on the project. These visits are usually for one-half or a full day once per week. The work can be done in conjunction with an engineer or after an induction session, he will be on his own.

COUPSE OUTLINE

The students are required to submit a minimum of 4 written, in some cases oral in steps number 2 and 3, reports during the 14 week semester.

The reports are submitted as follows:

1. Outline and Approval of Project

   By the end of the second week of the semester.

2. Progress Report Number 1

   By the end of approximately the sixth week.

3. Progress Report Number 2

   By the end of approximately the tenth week.

4. Final Report

   By the end of the fourteenth week.

PROJECT OUTLINE AND APPROVAL

After the student has selected a project topic and a description of how he feels he is going to attack it, he is required to submit an outline by the end of the second week of the semester. The outline includes a timetable of events that the student feels he can meet in order to complete his project by the end of the semester.

Before the student is allowed to proceed with the project, I check it over carefully to determine if he has realistic goals and if he can complete the project within the prescibed time.

After this analysis of the outline and any revisions made if necessary, the outline is approved and the student is on his own to do his work.

The student is also advised at this time that any problems, changes, additions, deletions, etc., with respect to the project must be reported to me at any time during the semester for possible project adjustments.

PROGRESS REPORTS

The project reports are submitted at approximately the end of the sixth and tenth weeks of the semester. The students are told that these reports are similar to reports that they may be required to submit to their supervisor in some future position.

The progress report usually consists of several pages depicting the project events since the last written report. It may contain information about personnel contacts, experiments, data collection, problems encountered, etc., and any deviations necessary to complete the project.

I use the project reports to determine if the student is progressing satisfactorily. If I note any problems, inconsistencies, etc., the student will be advised as to appropriate measures that should be taken.

FINAL REPORT

The final report is the climax of the student's project for the semester. The format of the report is the same as the format required in our Report Writing course and most other standardized reports which include the letter of transmittal, table of contents, list of illustrations, introduction, etc.

The student is required to arrange the material in a manner so that it can be easily followed. It is also suggested that the report be written in a manner that someone without knowledge of the project topic can understand the theme.

I encourage students to submit rough drafts of their reports to me before final typing. If the report is difficult to read and unorganized, it can be changed without too much difficulty in most cases.

The size of the report varies with the type of project and varies between 20 and over 100 pages. Projects involving data collection are usually shorter than projects involving research into specific engineering areas, such as, adhesives, machines, etc.

CONCLUSION

After the student has completed his project, there are a number of things he can achieve from his experience.

Often this project is the first in which the student has worked alone to achieve an unknown result. Many will comment on the difficulty in which information and data were obtained. They will also comment on the inability to sometimes obtain information that they feel should be readily available.

The student is required to do all the work himself. Thus, the report is something the student looks on with pride.

Many students retain copies of their project and submit them to prospective employers to show them how they were able to put together

an independent study. One student called several years after graduation for a copy of his report to use in seeking a new position.

By allowing the student to take part in the project selection, he has a personal interest in it. This is often reflected in his final report.

Students that are able to physically take part in projects at some industry or other facility are usually doing so as their first such involvement in their life. This experience is unmeasurable in that students are awed in some cases as to the new and different environment. Employers that have had students in this program have commented favorably in support of the course.

The employer has no direct cost so he is generally more favorable to this approach than to programs in which students are hired, etc. Therefore, the employer often can actually use the student in some cases to work on useful projects at no direct cost. It also gives the employer the opportunity to observe the student and has resulted in job offers.

When a student does his project in some plant, etc., it can also help him formulate some impressions about that organization or that industry as a whole. This can help him in seeking employment.

The only direct cost involved in the entire course is the tuition fee paid by the student.

APPENDIX A

INDUSTRIAL ENGINEERING TECHNOLOGY STUDENT REPORTS FOR SELECTED INDUSTRIAL PROBLEMS

Title	Student
Air Pollution (Sources and Types)	Seliskar
Construction of An Electric Winch	Templeton
Incentive Standards (Phillips Industries)	Barna
Designaire Trane Air Conditioning Company Residential and Commercial Bids	Ciambruschini
O.S.H.A. and Its Effect on Industry	Spuzzillo
Lathe Descriptions and Thin Industrial Applications	Gasson
Union vs. Non-union Construction	Schneider
Time Study of Variable Size Forgings - Dayton Forging and Heat Treating Company	Hall and Nieb
5 Year Forecast - Fixed and Non-Recurring Expense Budget - Frigidaire Div., G.M.	Courtright
Bus System Cost Analysis - University of Dayton	Paparelli
Automatic Surveillance and Traffic Control System - Cincinnati, Ohio	Payne
Industrial Shock Hazards	Wenning
Flexible Pavement Distress Identification and Repair, Kettering Ohio	Wanamaker
Polyurethanes at Inland Manufacturing Division of G. M.	Riguzzi
Injection Molding	Bell
Viscosity Degredation	Walton
U.S.A.F. Medical Center - Central Appointment Desk - Methods & Standard Study	Gillivan
Analysis of Customer Service Requests and Methods of Communications for the Dayton Power & Light Co.	Kattenheury
Industrial Psychology and Management	Zimmer
Labor Laws of the United States	Chandler